

## Course Syllabus

### MBMG 610 Innovation in Research Academic year 2022

**Course ID and Name:** MBBMG 610 Innovation in Research

**Course coordinator:** Assoc. Prof. Surapon Piboonpocanun, Ph.D. Tel: 02-441-9003-7 ext. 1233

E-mail: surapon.pib@mahidol.edu; piboons@gmail.com

**Instructors:**

Assoc. Prof. Surapon Piboonpocanun

**Credits: 1 (1-0-2)** (1 credit)

**Curriculum:** Doctor of Philosophy Program in Molecular Genetics and Genetic Engineering

**Semester offering:** Second semester

**Pre-requisites:** None

**Course learning outcomes:**

Upon completion of this course, students are able to:

- (1) Demonstrate ability to plan, inquire information and use it to develop model of potential innovative products
- (2) Demonstrate ability to search and map out scientific research area that will yield innovative products
- (3) Demonstrate teamwork, interpersonal skills and responsibilities for the work assignments

**Alignment of teaching and assessment methods to course learning outcomes:**

<b>Course learning outcomes</b>	<b>Teaching methods</b>	<b>Assessment methods</b>
1. Demonstrate ability to plan, inquire information and use it to develop model of potential innovative products	(1) Mind mapping, Interviewing, Exploration, and Reflection (2) Presentation (3) Questions and discussion	(1) Presentation (2) Participation in activities such as Idea telling
2. Demonstrate ability to search and map out scientific research area that will yield innovative products	(1) Portfolio of idea and prototype (2) Questions and discussion	(1) Presentation (2) Participation in activities such as Idea telling (3) Prototype analysis
3. Demonstrate teamwork, interpersonal skills and responsibilities for the work assignments	(1) Mind mapping and analysis (2) Presentation (3) Questions and discussion	(1) Presentation and Prototype evaluation

**Course Description**

Molecular biosciences-based research and innovation; Technology Readiness Level and how basic research becomes innovation development; Interlectual Property; Thai Patent and Petty Patent; exploration of Patent Databases; reading Patent files; entrepreneurships; lean canvas; Prototype assembly; startup pitching

**Course outlines:**

**Class meeting:**

<b>Week</b>	<b>Topic and Activity</b>
1	IP and Innovation cycle
2	Patent search DB and Prototype building
3	Patent, Design thinking, Lean canvas
4	Design thinking, Lean canvas and Technology Readiness Level (TRL) comparison, Crowd funding (How to)
5	Pitching (how-to, preparation) and Prototype (check-list)
6	Pitching (testing animated presentation), Prototype 1st evaluation (matching Lean canvas and TRL)

**Assessment Criteria:**

Assessment Criteria	Assessment Method	Scoring Rubric
Ability to plan, inquire information and use it to develop model of potential innovative products (35%)	(1) Observation (2) Discussion (3) Questions and Answer	Creativity and Pre-class imagination
Ability to search and map out scientific research area that will yield innovative products (35%)	(1) Observation (2) Discussion (3) Questions and Answer	Design thinking and Prototype development
Teamwork, interpersonal skills and responsibilities for the innovative products (30%)	(1) Presentation, Pitching (2) Discussion	Pitching the innovative product

Student's achievement will be graded using symbols: A, B+, B, C+, C, D+, D and F based on the criteria as follows:

Percentage	Grade	Description
80–100	A	Excellent
75–79	B <sup>+</sup>	Very Good
70–74	B	Good
65–69	C <sup>+</sup>	Fairly Good
60–64	C	Fair
55–59	D <sup>+</sup>	Poor
50–54	D	Very Poor
0–49	F	Fail

### Evaluation Rubric

#### Creativity and Pre-class imagination (15%)

Criteria	Need to improve (-2)	Satisfactory (-1)	Exceed Expectation (0)
Prototype Design (5%)	Prototype lacks of components that will solve problem	attempts to include elements in Prototype but may not work efficiently	Well-designed Prototype that could work and solve problem
Developing Ideas (5%)	Shows idea but cannot shape into a product	Shows some imagination when shaping ideas into a product	Carefully evaluates the quality of ideas and selects the best one to shape into a product
Total (10%)			

#### Design thinking and Prototype development (45%)

Criteria	Need to improve (-4)	Satisfactory (-2)	Exceed Expectation (0)
Developing and Revising Ideas and Products (20%)	Selects one idea without evaluating the quality of ideas Does not ask new questions or elaborate on the selected idea	Develops some original ideas for product(s),but could develop more with better use of idea-generating techniques Shows some imagination when shaping ideas into a product, but may stay within conventional boundaries	Carefully evaluates the quality of ideas and selects the best one to shape into a product Seeks out and uses feedback and critique to revise product to better meet the needs of the intended audience
Prototype Design (10%)	Prototype lacks of components that will solve problem	attempts to include elements in Prototype but may not work efficiently	Well designed Prototype that could work and solve problem
Originality (10%)	relies on existing models, ideas, or directions; it is not new or unique	show a tentative attempt to step outside rules and conventions, or find new uses for common materials or ideas	use common materials or ideas in new, clever and surprising ways
Value (5%)	impractical or unfeasible	it may not solve certain aspects of the defined problem or exactly meet the identified need	it solves the defined problem or meets the identified need is practical, feasible
Total (45%)			

Pitching (40%):

Criteria	Need to improve (-2)	Satisfactory (-1)	Exceed Expectation (0)
Pitching (15%)	presents ideas and products in typical ways	attempts to make presentation more lively and engaging	presentation is fun, engaging, and powerful
Question and Answer (5%)	Hesitate, not able to fully explain Prototype functions	explain Prototype functions but lacks of detail in some parts	explain Prototype functions in detail
Total (20%)			